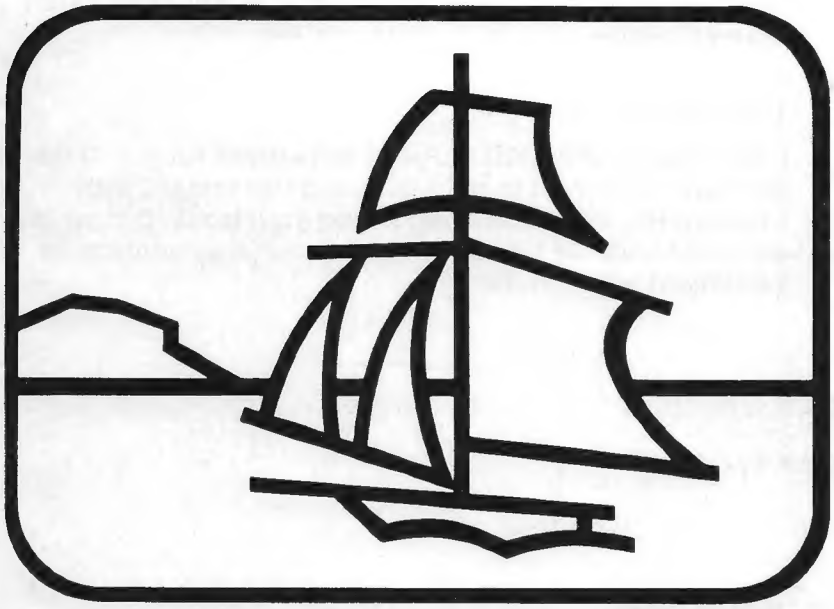
THE SEARCH SERIES

# GEOGRAPHY SEARCH
## TEACHER'S MANUAL



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Tom Snyder's adventures as an educational-software designer, author, and consultant began in his own classroom. He first developed the Search Series simulations for students at the Shady Hill School in Cambridge, Massachusetts, where he teaches science and music. As the scope of his computer activities broadened, Tom formed his own company, Computer Learning Connection.

In addition to being involved with computers and education, Tom writes fiction and music for children. He holds a B.A. from Swarthmore College and an M.A. in education from Lesley College.

## Use of Software

Use of the GEOGRAPHY SEARCH software is subject to the restrictions contained in your licensing agreement with McGraw-Hill. Information regarding your backup copy is included with the hardware-specific loading instructions packaged with the diskette.


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# Table of Contents

# WELCOME

Welcome to GEOGRAPHY SEARCH. There is a special excitement about the Search Series. You will feel it yourself and see it in your classroom. The simulation experience generates an enormous amount of energy and enthusiasm. The learning process seems to gather a momentum of its own due to the high degree of student involvement.

The new technology involved is one part of the excitement. Another is the range of learning experiences Search offers to students. The simulation utilizes the capabilities of the microcomputer to build on and complement traditional, time-tested modes of teaching and learning.

In GEOGRAPHY SEARCH, your students are crew members of an ancient sailing ship looking for the New World. The computer helps them navigate, using the sun, stars, ocean depth, climate, and trade winds. The goal is to locate the New World and return safely home with promised riches. To reach their goal, students make various decisions based on both content information in the Searchbook (student workbook) and changing data from the computer. The process involves reading, interpreting and recording data, decision making, and teamwork—all basic skills that enhance the study of geography or the study of the history of exploration.

This teacher's manual contains suggestions and guidelines for working with the simulation in your classroom. It also includes samples from the Searchbook. Read it through, review the Searchbook, and then try the simulation for yourself before introducing it to your students. You will see how the activity works and how the information in the Searchbook relates to making decisions at sea.

We're eager to hear about your experiences with GEOGRAPHY SEARCH—how you have used it with your students and how you have tailored the activity to fit your curriculum needs. If you have suggestions or comments, please forward them to us through the Webster or EDL/McGraw-Hill sales representative in your area.

Enjoy the coming days of exploration.

Tom Snyder

# Organizing the Search

## Before You Begin

The Searchbook is a combination of a fictitious account, an instruction manual, and a student workbook. We encourage you to have your class read it all the way through before beginning the simulation. It is very effective when read in a group situation. You may then want to spend several class periods discussing the geographical concepts covered in the text. Questions and vocabulary listings are included to help with discussion. You will read more about the Searchbook in the learning strategy section.

## Ship Assignments

The simulation is designed to be used by several groups of students. Each group, or ship's crew, functions as a decision-making unit. Students work together at the computer whenever the screen announces their turn, or back at their desks or tables sharing and discussing the information they have just received in preparation for their next turn.

Four is an ideal number of groups, or "ships," in this simulation, and the ideal number of students per group is five or six. If your class is larger or smaller the flexibility of the simulation allows you to adjust either the number of groups or the number of members in a group easily. The simulation will accommodate up to six groups. Once you have your groups settled, assign each to a ship. The ship's names are COURAGEOUS, DAUNTLESS, WINDSONG, ALERT, SEAWIND, and GOODSPEED.

When actually arranging student groups (either by their choice or by teacher assignment), remember that the high level of interaction within the group will help to develop interdependence.

## Setting Up the Room

The microcomputer should be located in such a way that an entire crew can gather (usually kneeling) around it. Each group must be able to sit together between turns to discuss future plans. Gathering desks together into four or five separate "islands" or using tables will make it easy for students to work together.

## Loading and Storing the Program

Instructions for loading the program into the computer are included with the diskette itself. Once the program is loaded, the computer will take over the organization, and you need only respond to questions on the screen.

Before beginning the simulation, choose a file name for the class. This can be any short word. It will serve to identify the group's information for the computer. The computer will ask you to type in the file name the first time you run the simulation with the group and each subsequent time. Through the computer's ability to store information on the diskette, a record of each crew's current status can be saved at the end of every session. When you finish play for the day, simply remove the diskette.

## As You Sail

There are probably as many possible time and schedule variations to use with GEOGRAPHY SEARCH as there are classrooms to play the simulation. However, the program is flexible, and you can tailor a schedule to fit your own classroom needs and plans.

One format that has worked for many teachers is to plan two class periods per week for the search. During the first period students read (reread, actually) a single section in the Searchbook and then discuss it as a group or do related written assignments. They might also be given a short quiz on this first day. The second day involves their actually playing the simulation and recording their results.

## Record Keeping

To record information about the status of each group's progress during the course of the simulation, you may want to reproduce the chart on page 22. A sample is shown below. The comments column can also include assignments or other notes.

Class name: Ms. Smith's 7th grade Date: September 28

Computer file name: Smith

| Ship: | Students: | Comments: |
|---|---|---|
| Courageous | Juan Torrez, Nina Green, Sue Walsh, Jeff Hill, Tom Chin | Group set up work area by north window. |

# The Search Learning Strategy

The Search learning strategy is built on the use of computer simulation as a new vehicle for achieving traditional learning outcomes. The Search simulations were designed after extensive testing with students and consultation with teachers. Out of this field testing came hundreds of details that determined factors such as pacing, degree of difficulty at any one time, display of information on the computer screen, and methods by which students make choices. As used in GEOGRAPHY SEARCH, the simulation is intended both to teach a set of academic skills and concepts, and to improve problem-solving and group-process skills. Below is a brief look at the instructional strategy.

## The Simulation: Interaction with a Microcomputer

The simulation is designed to permit students to make errors as they attempt to achieve their goals. Sometimes the choices they make at the computer will not be the wisest or the most constructive. However, no matter what choices they make, the computer will not "dump" the program or print an error message on the screen. The advantage of simulation is that it permits students to explore without danger. In the actual exploration of the seas, many ships and people have been lost, and many dollars have been spent. Aboard your students' ships, the worst that can happen is the loss of a turn, or perhaps a message saying "You cannot go ashore, you are at sea."

In addition to allowing students to learn by their mistakes, the simulation facilitates the following learning experiences:

- ☐ Interaction with the microcomputer
- ☐ Risk analysis, low-level risk taking
- ☐ Making predictions based on data
- ☐ Autonomy in decision making
- ☐ Assuming responsibility for the consequences of decisions
- ☐ Adapting to circumstances

Developing a simulation as a vehicle for learning involves special program-design needs. One is to create a model that makes abstract concepts more tangible for students. The other is to offer an effective and accessible learning environment. This involves a certain amount of manipulation as complicating factors extraneous to the central learning issues are excluded. A sailing simulation, meant to teach skills in geography, does not include an accurate modeling of all the aspects involved in a voyage; for example, the precise amount of food needed for such a voyage.

This simplification provides an additional opportunity for learning, as part of the value of a simulation experience lies in spending time exploring the reality issue itself with students. Several questions to raise in class discussions are: "In what ways does the computer show what it was really like on an ancient sailing ship?" "What are some parts of the sailing experience that you can't get from a computer?" "Are there times when the computer makes life aboard your ship too difficult or too easy?" These are topics that can be handled effectively through class discussion, writing assignments, or debates.

## The Searchbook: Interaction with the Workbook

The Searchbook and the simulation are designed to work together. They provide reinforcement and backup for each other. Your students can initially enjoy and succeed in the simulation without a total comprehension of all the concepts involved. This encourages eager participation, and eventually complete learning will take place. (Very few early explorers fully understood the concepts behind the tools they used to discover new worlds!)

The Searchbook gives the simulation an academic framework. First, it provides information on geography in a textbook style that is familiar. Second, it offers practice in the following skills:

- □ Reading and writing
- □ Vocabulary building
- □ Locating needed information in the textbook
- □ Record keeping
- □ Mapping and map interpretation
- □ Drawing conclusions from accumulated data
- □ Interpreting graphic and symbolic data

The Searchbook opens with the story of Captain Quinton's trip to the New World. This tale of an ancient sailing captain's journey across uncharted waters gives students an overview of the trip they will take. It also provides content information and clues that they will refer back to throughout the course of the simulation.

The next seven sections provide specific information on geography in the following areas: Food and Water for the Journey, Sounding the Ocean's Depth, Latitude and the Stars, Longitude and the Sun, The Wind and Sailing, Temperature, Rainfall. New vocabulary is highlighted, and each section includes a glossary. Review questions, with space for the student to answer, follow each section. Guidelines for performing specific crew members' jobs and for working at the computer are also given.

The last section, Life Aboard Ship, describes each crew member's role and explains what happens when the crew goes to the computer. Student worksheets—the Captain's Log and Map—are located at the end of the Searchbook, making it easy for students to use them during the simulation. They are shown on page 23 for your information.

The simulation begins with the choices shown in "A Sample Run" on page 12. The students have to make their first sailing choice immediately. If they have read the Searchbook material and discussed it in class, they will have some grasp of the concepts, and thus greater confidence when they begin playing.

Then, as the students continue to play the simulation, they should go through the Searchbook again and focus on each section separately. To support content and basic-skills learning, students should be required to master vocabulary words and to answer review questions in writing. Also, each student should keep full records of the journey, using the Captain's Log and the Map.

This is a good time for you to consider incorporating any related activities you have planned—for example, book reports or some of the supplementary activities listed on page 16 or other activities found in the textbook you are using with your class.

A sample from the Searchbook appears on page 10.

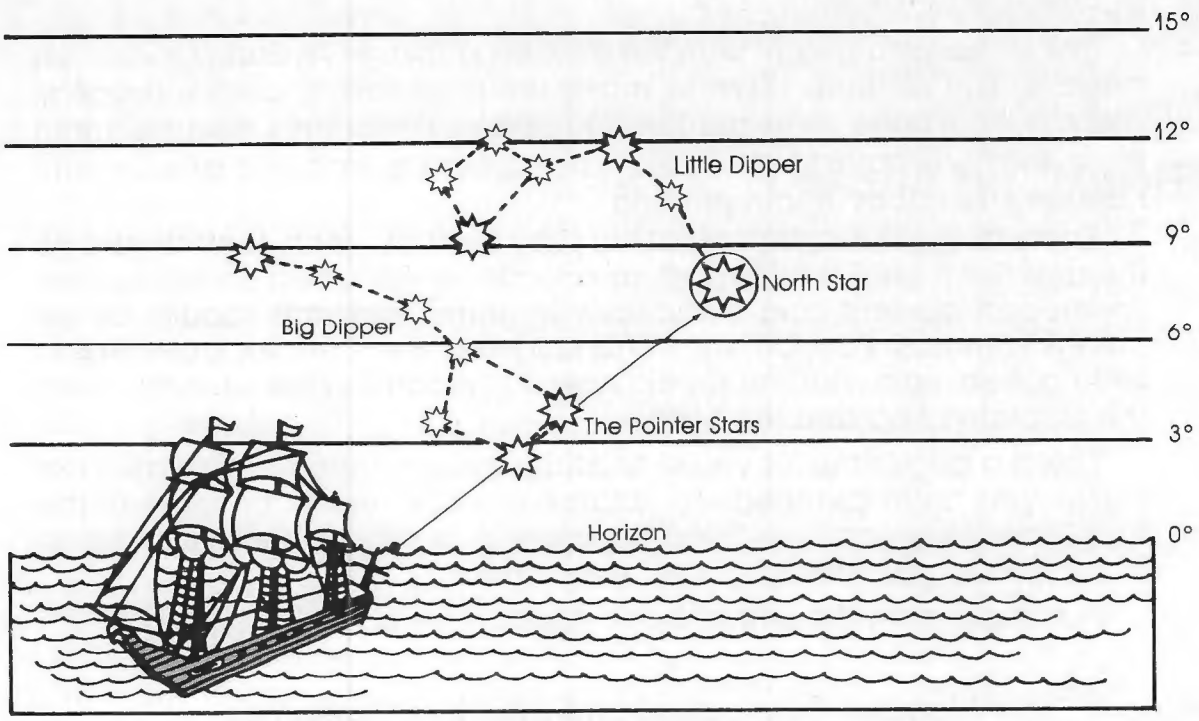
### Being a Crew Member: Interaction and Affective Outcomes

At the end of a crew's turn at the computer, the screen displays a large amount of sailing information. The students take this information back to their desks and use it in planning their next course of action. Crew members will quickly notice that the information is displayed for only a few moments before it is replaced by a message saying that it is another group's turn. Initially, this quick display may seem to be an oversight in the computer program. In fact, it is intended to make students see the necessity for organization and cooperation. They will assign tasks ("You get the ocean depth. I'll get the latitude.") and later share the information.

The need to share information in order to make good sailing decisions is the basis of the group-interaction component of Search. No student will be able to master all the information alone. This facilitates the following affective outcomes:

- ☐ Each student is actively involved in the experience.
- ☐ Students explore methods of reaching group consensus.
- ☐ Students who ordinarily have difficulty working together (boys and girls at certain ages, different cliques within a classroom) become part of a cooperative effort.

Most important of all, Search is designed to guarantee student success. With this success comes an enthusiasm about learning that carries students through GEOGRAPHY SEARCH and often shows up in other classroom activities as well.




Sailors gave names to many constellations close to the North Star so that they could find the star quickly.

very important to be able to find the North Star. Sailors gave names to many constellations close to the North Star. By looking for these shapes, the navigator's eyes quickly moved to his guiding star.

Above is a picture of how the northern skies looked to the sailors of Vesuvia. The North Star is circled to help you learn to find it. (On the computer screen, the North Star blinks on and off to make it easier to find.)

**When it is your job** as a member of the crew to find the latitude of your ship, locate the North Star among the other stars on the computer screen. Using the degree numbers to the right of the stars, estimate and write down how many degrees above the horizon the North Star is. Later, when you are asked by the captain and crew for the latitude of your ship, tell them the number you have written down. That number is the latitude of your ship above the equator.

## Search Words

**constellations:** groups of stars that are thought to look like objects or animals and that have been named after them

**degrees:** the 360 parts that a globe is divided into (used to measure distance)

**latitude:** location north or south of the equator

# Handling Student Questions

Student questions are always an important part of the teaching and learning process. How you handle these questions depends in large part on the objectives you have developed for a given lesson.

In the case of GEOGRAPHY SEARCH, the overall guideline regarding student questions concerning the operation of the simulation is don't answer them! The reasoning behind this is tied to the goals of the simulation experience and the philosophy underlying it. The program encourages students to take information they already have (from the workbook, from class discussion, or from past experience) and apply it to a new situation. In addition, the simulation provides an opportunity for students to learn through trial and error. In the course of the simulation they will gather information resulting from imperfect decisions and then use this information to make better decisions as they go on.

The simulation and accompanying workbook provide all the information your students need to get off to a good start on their voyage. In addition, many student questions will eventually be answered by virtue of what the computer will or will not permit.

However, frustration at not "knowing all the answers" may occur in the first several rounds of play. Here are some questions students commonly ask. Resist the urge to give them direct answers. Instead, reply with a polite "I don't know," "I can't tell you," or "Perhaps the answer is in the workbook."

- □ How long will 13 barrels of supplies last?
- □ Can you tell us which star is the North Star?
- □ Terry is not here today! What should we do?
- □ What happens if we try to go ashore while we are at sea?
- □ What happens if we run out of food?
- □ Why haven't we hit land yet?
- □ Why is the wind always blowing the wrong way for us?
- □ The information isn't on the screen long enough for us to read it. What should we do?

If a group is having a particularly difficult time, you may choose to sign aboard as a naval consultant. However, the best course of action is to encourage the students to use the workbook as a resource and simply discover what works.

# A Sample Run of One Ship's Turn

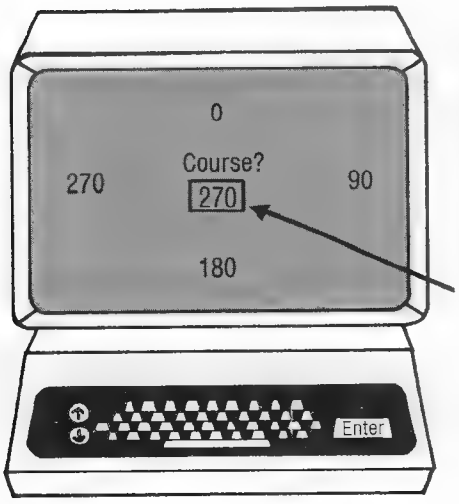
Below is a sample run of one ship's turn at the computer. In the sequence of each turn, students both give information to the computer and get information from it.

Beside each drawing are comments by students who have used the simulation, explaining each step in the turn.

1.

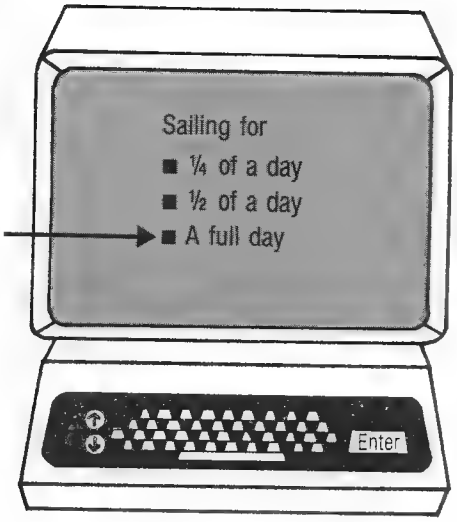

"Each turn begins with these three choices. We chose this action because we want to set sail as soon as possible. If we had asked to go ashore, the computer would have told us that we couldn't because our ship is at sea."

2.



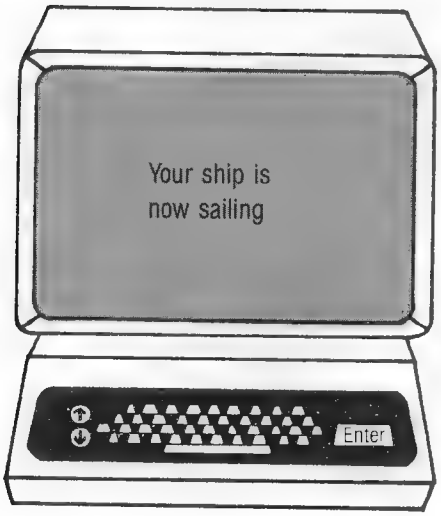

"The computer asked about wind direction. Since this is our first day out, we know from the queen's navigator that the wind is coming from 90 degrees. After we have typed in 90 and pushed ENTER, the computer will show us all of the directions that a 90-degree wind will let us sail in. Using the up and down arrows, we will choose a compass direction and then push ENTER."

3.



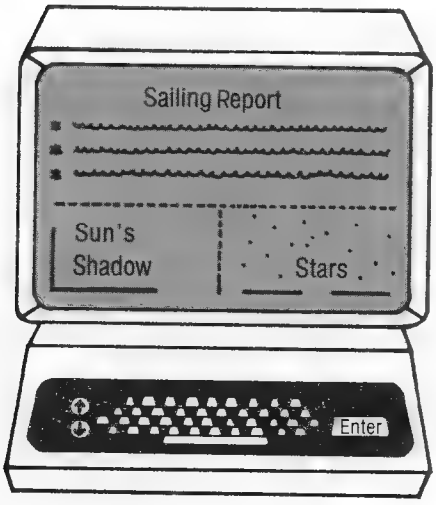

"Since the computer has allowed us to sail toward 270 degrees (the wind was right), we will ask to sail that course for a full day. (There will be times when we will want to sail for less than a full day on one course.)"

4.




"For the next few moments the computer will be sailing our ship in the direction we requested. (On a windy day we will go farther than on a calm day.) Then a sailing report will appear on the screen with information for our next turn."

5.




"This sailing report has far too much information in it for one person to get alone, especially since it is on the screen for only a short time. The members of our crew will have to split up the task of recording all of this information."

"Our ship's turn is now over. The crew members of the DAUNTLESS will now be called to the computer for their turn, and our crew has a lot of planning to do before our next turn in a few minutes."

# Student Guidelines

Throughout the Searchbook, student crew members are given directions and guidelines for their jobs during each turn at the computer. An example is shown on the sample page below:


This drawing shows the patterns of wind movement across the face of the earth. North of the equator, large circles of wind blow in a clockwise direction. South of the equator, the wind moves in counterclockwise circles.

but also at angles to the wind, a ship could sail to the east with many different breezes. As long as some wind is blowing, a ship can make some progress in the direction it wants to go.

**When it is your job** as a member of the crew to record the wind information at the computer, write down the direction and speed of the wind as it is written on the computer screen. Later, during the captain's meeting, when the crew members are deciding on the ship's course for the next day, you will be able to tell them whether or not the wind will allow the ship to sail in the direction they want. If the crew wants to sail a course of due south (180 degrees on a compass) that day, but you have written down from the computer that the wind will be blowing directly from the south, you will have to tell the captain to choose another course.

# Between You and the Computer

We thought you might enjoy knowing something of what went into setting up the computer program itself. The information below will give you a sense of the parameters the computer uses in responding to student input. It will also help you monitor the status of each crew as your students go through the simulation.

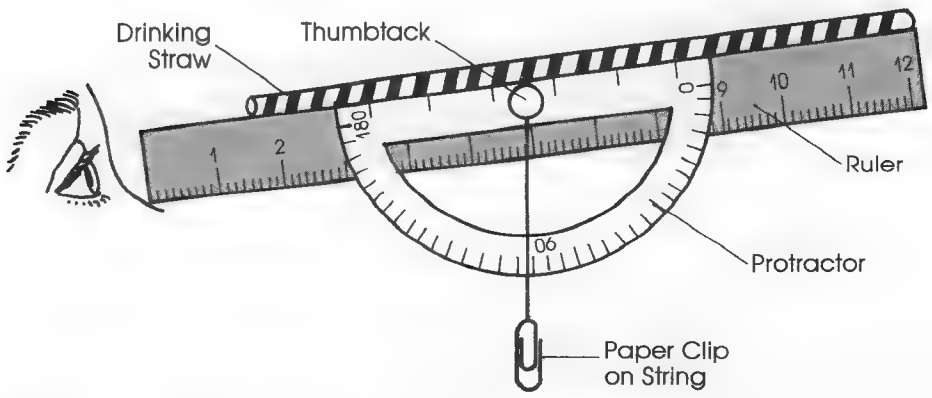
Needless to say, these concepts are confidential—strictly between you and the computer!

- The circular winds off the west coast of Vesuvia blow in a clockwise direction, as do the real trade winds between Europe and America. Any ships sailing to the north of the Port of Vesuvia will encounter winds blowing to the east.
- The provisions aboard each ship are depleted at a rate of one to three barrels per day (per turn). When a ship runs out of food, the computer will allow that ship to survive until the provisions have gone to minus 20 barrels, at which point that ship starts over again at Port Vesuvia (minus any gold or money).
- With strong winds, a ship can conceivably sail from Vesuvia to the New World in as few as four days (turns).
- The New World is a continent much larger than Vesuvia, and it extends from just below the equator to 15 degrees north. The City of Gold is about halfway up the western coast of that continent.
- It is possible to sail home from the City of Gold by continuing westward around the world. The trip is somewhat longer and lonelier, but it has no land obstacles. Students sailing this course will notice that after several days of sailing to the west of the New World, their home time clock will be telling them that noon aboard the ship is now earlier—not later—than in Vesuvia.
- If a ship should sail too close to one of the pirate ships, that ship will lose half of its food and gold. The pirates' favorite place to wait is just outside the City of Gold.

# Supplementary Activities

Here are some related individual and group activities you may want to try with your class:

1. Have students learn to identify (and then draw) the major star constellations. (This is, of course, best done at night if possible.)
2. Plan a visit to the planetarium if there is one in your area.
3. Have students keep a chart of the length of the sun's shadow from the same place every day when the sun's shadow is at its shortest (noon). An interesting pattern will develop.
4. Have the class make a clock chart of times in the major world cities when it is noon in their home town.
5. Have students read biographies of famous explorers. They can then report on them to the class or do written book reports.
6. Have students keep a chart of daily wind direction in the most open area near the school. They may be able to detect a prevailing local wind pattern.
7. Have students watch and report on local television weather reports. What concepts and terms do the reports have in common with the search experience?
8. Have students research modern weather forecasting.
9. Have students compose a short message (including information on how the receiver can respond) to be attached to a helium balloon. Send up one balloon every day for 20 days. As finders respond to the message, keep track of their locations with pins on a map. This is another way of detecting prevailing winds.
10. Have students use a ruler, a drinking straw, a thumbtack, a plastic protractor, some string, and a paper clip to make a device that will tell them the high angle of objects in the sky (moon, stars). See the drawing below:



# Facts and Concepts About Geography

In GEOGRAPHY SEARCH, the following facts and concepts about geography form the content of the simulation. Students will learn that:

- ☐ The ocean floor has a varied shape and geography, as do the continents.
- ☐ The depth of the ocean was an important navigational tool for early sailors.
- ☐ Star constellations were used by ancient people to locate important stars, such as the North Star.
- ☐ The North Star's primary importance is that it does not move as do the other stars during the night and can, therefore, be useful in determining direction.
- ☐ Latitude can be determined using stars.
- ☐ Earth time varies in different east-west locations due to the earth's rotation and the relative position of the sun.
- ☐ The difference in time between two places will indicate the differences in their relative east-west position, or longitude.
- ☐ Global winds arrange themselves in predictable patterns.
- ☐ These patterns (trade winds, for example) were very important in the navigation of sailing ships and helped to determine routes and destinations.
- ☐ The progress of early sailing ships was subject to the direction of the wind, but the ships were designed to permit sailing at angles to the wind.
- ☐ Due to the angle of the sun's rays, global temperatures vary predictably according to relative north-south location.
- ☐ Average temperature was an aid to early navigators in determining their latitude.
- ☐ Certain areas of the world receive significantly more rainfall than others due to updrafts that carry moist air to colder altitudes. (Two of these areas are the equator and the seaward side of mountain ranges.)
- ☐ Rainy weather was a navigational hazard for early sailors because clouds prevented celestial navigation.
- ☐ Many factors, both geographical and human, affected the decision-making process aboard early sailing vessels.
- ☐ Sound decision making depends on participation and input from each crew member.

# Search Words

Below is a list of the vocabulary your students will encounter in each section of the Searchbook:

## Captain Quinton's Trip to the New World

**advisers:** people who give expert opinions on how to solve a problem
**alternative:** one of two or more possibilities to choose from
**constant:** not changing
**continent:** a large land mass
**departure:** the act of going away or starting out
**enlist:** to ask for help
**environment:** surroundings
**horizon:** the line where the earth and the sky seem to meet
**intuition:** a feeling that something is so
**navigator:** a person who plots the course of a ship
**survey:** study
**veer:** to turn sharply in another direction
**venture:** a project that involves risk

## Food and Water for the Journey

**estimate:** to make a guess about the size or amount of something
**provisions:** food and other necessary supplies
**record:** to write down information so you can use it later

## Sounding the Ocean's Depth

**depth:** the distance downward or inward from a surface
**sounding:** measuring depth, especially in water
**trench:** a long ditch

## Latitude and the Stars

**constellations:** groups of stars that are thought to look like objects or animals and that have been named after them
**degrees:** the 360 parts that a globe is divided into (used to measure distance)
**latitude:** location north or south of the equator

## Longitude and the Sun

**longitude:** east or west location on the globe
**minutes:** a unit for measuring longitude

## The Wind and Sailing

**clockwise:** turning in the same direction as the hands on a clock
**counterclockwise:** turning in the opposite direction of the hands on a clock
**trade winds:** a clockwise circle of winds
**wind:** large masses of air moving over the surface of the earth

## Temperature

**angle:** slant
**temperature:** the hotness or coldness of something

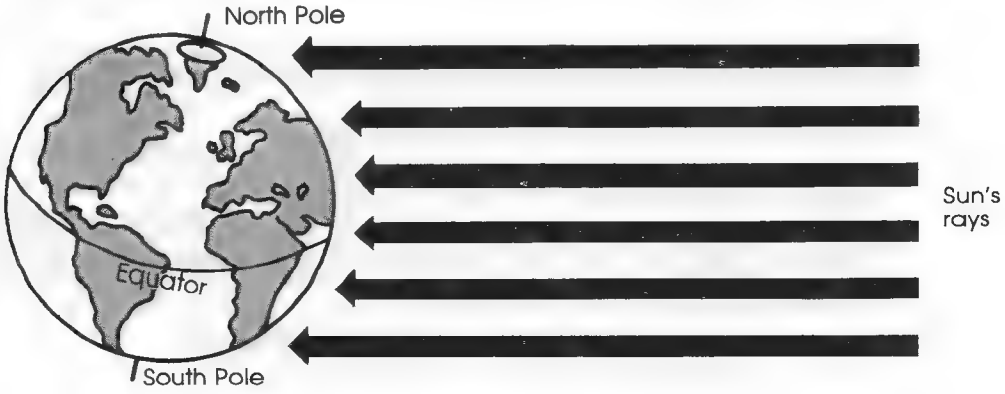
## Rainfall

**condenses:** changes from a gas into a liquid
**evaporates:** changes from a liquid into an invisible gas

## Searchbook Illustrations

The drawings in the student workbook serve to illustrate the content and provide additional explanation of the concepts involved. The sample art shown below is an example. Encourage students to use various media to create their own interpretation of life aboard ship.

North and south of the equator, the sun's rays are slanted, giving less warmth than they do at the equator.



# Search Review

The content review questions from the Searchbook are grouped here for your convenience in planning. In the actual workbook, the Search Review section includes space for students to write their answers.

### Captain Quinton's Trip to the New World

1. Where on the new continent is the City of Gold thought to be located?
2. From which direction will the wind be blowing on your ship's first day out of Vesuvia?
3. What are two reasons why it is best to sail in a southwest direction rather than due west when you leave the Port of Vesuvia?

### Food and Water for the Journey

1. How can your ship get provisions?
2. How will you be able to tell how many barrels of provisions are necessary?

### Sounding the Ocean's Depth

1. How can sailors find the depth of the ocean below them?
2. How can knowing the depth of the ocean help the navigator of a ship?

### Latitude and the Stars

1. Why does the North Star appear to remain in one spot throughout the night?
2. Why is the North Star invisible to someone sailing below the equator?
3. What happens to the position of the North Star as you sail farther to the north of the equator?
4. What is the formal word for a ship's location north or south of the equator?
5. If the computer shows you that the North Star is 7 degrees above the horizon, can you find the line along which your ship must be located? How?
6. Why are star constellations useful to sailors?

## Longitude and the Sun

1. When it is noon where you live, why is it not necessarily noon in another part of the world?
2. How can you tell when it is exactly noon?
3. If a ship has sailed to the west of Vesuvia for several weeks, why will noon aboard that ship not happen at the same time as noon back in Vesuvia?
4. How will you be able to tell when it is noon aboard your ship?
5. If the computer tells you that at noon aboard your ship the time back in Vesuvia is 12:32, can you find the line along which your ship must be located? How?

## The Wind and Sailing

1. What can cause the wind to blow?
2. What two things can redirect the wind as it blows from the North Pole to the equator?
3. In what direction do the enormous circles of wind north of the equator blow?
4. Why is it important for sailors to know about the direction of these circles of wind?
5. If a ship is trying to sail to the west, but the wind is blowing from the west, how can that ship still make some kind of progress to the west?

## Temperature

1. Why is the equator usually the warmest place on earth?
2. Why are the North and South Poles usually the coldest places?
3. If your ship is lost at sea, how can the day's temperature give you a clue about your location?

## Rainfall

1. Where does rain come from?
2. What two kinds of places on earth get a lot of rain?
3. Why is there so much rain in these places?
4. What difference will it make to your ship if it finds continuous rainy weather?

# Record-Keeping Chart

Class name: Date:

Computer file name:

| Ship: | Students: | Comments: |
|---|---|---|
| Courageous | | |
| Dauntless | | |
| Windsong | | |
| Alert | | |
| Seawind | | |
| Goodspeed | | |

# Captain's Log and Map

## Captain's Log

| Day # | The wind is blowing from... ____° | Wind speed ____mph | Latitude ____° ____ north or south | Longitude ____ minutes east or west | Depth of water ____feet | Food Provisions ____barrels | Temperature ____°F |
|---|---|---|---|---|---|---|---|
| 1 | ° | mph | ° | min | ft | bbl | °F |
| 2 | ° | mph | ° | min | ft | bbl | °F |
| 3 | ° | mph | ° | min | ft | bbl | °F |
| 4 | ° | mph | ° | min | ft | bbl | °F |
| | ° | | ° | | | | |